

What is claimed is:

[Claim 1] A method for determining a maximum current flow in the electric power line conductor (1) under faulted circuit conditions, the method comprising:

- (a) in the field environment, applying a specific frequency activation signal and code key from an exciter positioned proximate to the faulted circuit monitoring apparatus located on the power line conductor;
- (b) at the exciter, detecting a data signal from the faulted circuit monitor, The data produced by modulating a specific frequency faulted circuit monitor in response to a measured current parameter;
- (c) at the exciter, receiving the faulted circuit data from the data signal;
- (d) associating the faulted circuit current magnitude with the conductor phase information for the particular faulted circuit monitor unit;
- (e) repeating steps (a), (b), (c), and (d) for all power line phase conductors P1, P2, and P3;
- (f) and storing the data and phase conductor information in the memory of the exciter for downloading to a host pc.

[Claim 2]

The method of claim 1 wherein applying a specific activation signal comprises applying an un-modulated signal having a specific frequency chosen to resonate with an rf detection circuit 20 of the faulted circuit monitor.

[Claim 3]

The method of claim 1 where in the fault current response time of the faulted circuit monitor is slowed to allow for “inrush” conditions on the power line.

[Claim 4]

The method of claim 2 wherein applying a specific frequency activation signal comprises applying a specific frequency or two distinct frequencies close to one another.

[Claim 5]

The method of claim 1 wherein applying a specific activation signal comprises positioning the exciter apparatus near the faulted circuit monitor to actuate the faulted circuit monitor with the specific frequency signal.

[Claim 6]

The method of claim 1 wherein a specific code key pattern of binary data are transmitted from the exciter by modulation of the rf signal.

[Claim 7]

The method of claim 1 wherein the faulted circuit monitor apparatus responds to only a match with the exciter transmitted code key.

[Claim 8]

The method of claim 1 wherein detecting a data signal from the faulted circuit monitor comprises detecting faulted circuit current magnitude information from the faulted circuit monitor data signal.

[Claim 9]

The method of claim 1 wherein detecting the data signal from the faulted circuit monitor comprises detecting an impedance modulation of a radiated rf field of the exciter and decoding the data as the impedance modulation by operation of the faulted circuit monitor.

[Claim 10]

The method of claim 9 comprising sequentially associating detected identification information with respective power line conductor phases.

[Claim 11]

The method of claim 1 wherein downloading the faulted circuit monitor data comprises communicating data over a hard wire link, a wireless link, or a network.

[Claim 12]

The method of claim 11 wherein communicating data comprises: establishing a temporary connection between the exciter and the host pc; conveying the data from the exciter to the host pc over the temporary connection; and breaking the temporary connection.